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U.S. Bureau of Labor  
Statistics

Wages and hours of labor  
in the coal mining...

[Washington]

[1919]

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# Wages and Hours of Labor in the Coal Mining Industry in 1919.

**T**HIS article presents in a summary form the facts as to hours of labor and earnings of employees in the coal mining industry in 1919. The gathering of the data on which the article is based formed a part of the industrial survey referred to in the August MONTHLY LABOR REVIEW.

No attempt was made to secure data from all mines or even all mining States. In the anthracite fields the survey was confined to 22 mines operated by 10 different mining companies. All these mines were located in the State of Pennsylvania. Approximately one-tenth of the employees in the anthracite coal region are employed in these mines. Due care was taken that the mines to be included in the survey should be so selected that the results would be fairly typical of the entire anthracite field.

In the bituminous territory the survey covered 201 mines located in 18 of the most important producing States; it included a total of 40,508 employees in the industry.

The following table shows the number of bituminous mines which furnished data and the number of employees included in each State. The third column shows the total number of employees in the State as given by "Coal in 1917," published by the Bureau of Mines for the year 1917.

TABLE 1.—NUMBER OF MINES FURNISHING DATA AND NUMBER OF EMPLOYEES REPRESENTED.

State.	Number of mines.	Employees.	
		Number represented.	Total, 1917.
Alabama.....	5	1,394	28,385
Colorado.....	18	2,396	14,231
Illinois.....	16	5,925	84,090
Indiana.....	11	2,574	26,528
Iowa.....	11	1,476	14,266
Kansas.....	12	1,879	10,080
Kentucky.....	19	2,867	34,926
Maryland.....	5	812	5,919
Missouri.....	11	1,437	9,668
New Mexico.....	6	1,131	4,126
Ohio.....	13	3,083	45,509
Oklahoma.....	8	857	8,495
Pennsylvania <sup>1</sup> .....	31	9,772	173,968
Tennessee.....	7	390	10,421
Utah.....	7	857	3,485
Virginia.....	4	618	11,168
West Virginia.....	13	1,739	88,422
Wyoming.....	4	421	7,358
Total.....	201	40,508	581,616

<sup>1</sup> Bituminous mines only.

The ideal method of arranging the field work of a survey of this kind would be to have all the schedules cover the same pay-roll period. It was possible to carry this out in the anthracite field. All schedules in that branch of the industry are for the pay-roll period ending January 31, 1919. In the bituminous field, however, owing to the wide extent of territory to be covered and the limited amount of time available for the work, this method was found impracticable. The pay-roll periods for bituminous mining are distributed over a period of time extending from the last half of January to the last half of May, 1919.

In ordinary years the extension of the time of the field work would make comparatively little difference, as the entire period is usually one of sustained productive activity. During 1919, however, conditions were very different. Under the stimulus of war-time requirements production had been pushed to the utmost during the latter half of 1918, and both industrial plants and domestic consumers had laid in unusually large supplies. With the signing of the armistice industrial demand for coal fell off, and the mild winter enabled domestic consumers to carry over considerable supplies into the new year. For these and other reasons the demand for coal was much below normal during the first half of 1919, and the activity of the mines was correspondingly curtailed.

Not only was the period of the survey one of abnormally low productive activity but the rate of production was not constant throughout the period. In January mines were still running full time, though with diminished intensity. Thus all the mines included in the anthracite field were running full time on the date of the survey. In the bituminous field the rate of production fell off constantly during the first quarter of the year and was on the increase during April and May. As the survey was carried on State by State, the conditions found in any State depended to a considerable extent upon the time when that State was reached. The condition of the industry in the different States at the time of the survey was as follows:

- One-fourth to three-fourths time—Utah.
- One-fourth to full time—Colorado, Illinois, Indiana, Iowa, Kentucky.
- One-half to full time—Alabama, Kansas, Maryland, Missouri, Pennsylvania, Tennessee, Virginia, West Virginia, Wyoming.
- Three-fourths to full time—New Mexico, Ohio, Oklahoma.

These variations in operating conditions must obviously affect the figures for hours worked by mine employees in different States so profoundly as to make them practically useless for purposes of comparison between the States, whether the figures are presented in the form of "hours worked in the pay-roll period," or "hours worked per week day." The same statement applies fully to earn-

ings in the form of "actual earnings for the pay-roll period," but only to a limited extent to the figures for "average hourly earnings." There was no change in wage rates during the period of the survey; therefore any change in hourly earnings caused by the partial suspension of operations must have been limited to occupations paid on a tonnage basis, and have been due either to the depressing effect of slack conditions of operation or to the stimulative effect of diminished opportunity for work.

The material on which this article is based was obtained directly from the pay rolls of the companies by agents of the Bureau, sent out for that purpose. In the case of occupations paid on the tonnage basis arrangements were made in advance with the management of the companies to keep a time record for the employees in those occupations for the selected pay-roll period. Because of the fact that the working places of the miners are widely distributed and at unequal distances from the bottom of the shaft, the time checked was the time when the miner entered and left the mine. Consequently all figures relating to the hours of those miners and miners' laborers who work on a tonnage basis represent the time spent in the mine. It is estimated that in general it takes the miners from 15 minutes to 1 hour to get from the bottom of the shaft to their working places. In new mines the time may be less than 15 minutes and in old mines occasionally somewhat more than an hour.

So far as possible the essential facts about the hours and earnings of employees in anthracite mines and of those in bituminous mines are presented in tables of the same form. In some respects, however, dissimilar conditions in the two branches of the industry have made it necessary to use tables of different forms to present essentially the same body of information. Each table is preceded by a brief statement of the method by which it was compiled and the uses to which it may be put.

Table 2 presents various items of information concerning the hours and earnings of employees in the coal-mining industry. The data for anthracite and for bituminous mines are given separately. Each part is given in two sections, one dealing with outside laborers, that is, men working outside the mine, and the other with inside laborers. The information is given for each occupation separately.

For each occupation, following the columns indicating the number of employees in the occupation and the number of mines in which they were found, is given the following information: The average hours actually worked during the pay-roll period, the average hours per week day worked by the employees in that occupation, and full-time hours for the pay-roll period; the average amount actually earned during the pay-roll period, the average earnings per hour actually

worked, and the full-time earnings for the period. At the foot of each division of the table, inside and outside, respectively, is shown the hours and earnings of the entire number of employees working, and at the bottom of the table are shown the figures for all outside and inside occupations combined. A word of explanation may be needed as to how the figures in some of the columns were obtained.

The average hours actually worked were obtained by adding the hours actually worked by all employees in the occupation and dividing the sum by the number of employees in the occupation. The figures in the column headed "Average hours worked per week day" were obtained by ascertaining for each employee in the occupation the full number of hours worked by him during the period and dividing that aggregate by the number of week days in the pay-roll period. The result represents the number of hours per day that would have been worked by the employee if the work had been distributed uniformly over the week days of the pay-roll period. By dividing the sum of the hours of all employees in an occupation by the total number of employees in that occupation the average number of hours per week day in the occupation is ascertained.

By full-time hours is meant the number of hours which are regarded by employer and employee as constituting a day's work. The average full-time hours of the pay-roll period given in column 5 were obtained by multiplying the regular daily working hours in each occupation by the number of days constituting the full half-month pay-roll period. The aggregate of such hours for all the employees in each occupation was divided by the total number of employees in the occupation. The quotient is the average full-time hours of all employees in the occupation.

The average earnings actually received were computed by dividing the aggregate earnings for all the employees in each occupation by the number of employees in that occupation. The average hourly earnings were obtained by dividing the aggregate hourly earnings of all the employees in an occupation by the number of employees in the occupation. The average full-time earnings is the product of the average earnings per hour and the number of hours in the pay-roll period. The figure represents the amount that would have been earned by an employee in any occupation, if he had worked the full-time hours of the occupation and received the average hourly earnings of his occupation for each hour that he worked.

TABLE 2.—AVERAGE HOURS WORKED AND AVERAGE EARNINGS MADE IN ONE-HALF-MONTH PAY-ROLL PERIOD, AND AVERAGE FULL-TIME HOURS AND EARNINGS, BY OCCUPATION.

*Anthracite.*

Occupation.	Number of establishments.	Number of employees.	Average hours.			Average earnings.		
			Hours actually worked in half month.	Hours worked per week day <sup>1</sup>	Full-time hours in half month.	Earnings actually received in half month.	Earnings per hour.	Corresponding full-time earnings in half month.
<b>Inside:</b>								
Blacksmiths.....	13	30	124.7	8.9	112.0	\$73.56	\$0.652	\$66.26
Brattice men.....	17	116	111.9	8.0	112.0	62.80	.561	62.83
Cagers.....	22	231	126.9	9.1	112.8	65.78	.617	68.54
Car runners.....	17	342	109.9	7.9	112.1	55.02	.507	56.85
Company miners.....	19	656	91.1	6.7	112.0	54.79	.581	65.12
Company miners' laborers.....	19	632	102.9	7.4	112.0	54.26	.526	58.92
Consideration miners.....	10	498	101.4	7.2	112.0	61.21	.636	71.19
Contract miners.....	22	4,887	94.5	6.8	112.0	70.56	.612	68.29
Contract miners' laborers.....	20	1,855	78.7	5.6	112.0	49.99	.639	71.67
Door tenders (boys).....	20	247	105.8	7.6	112.0	33.66	.315	35.13
Drivers.....	22	479	105.3	7.7	112.0	52.66	.499	55.86
Engineers.....	17	121	130.9	9.2	117.9	70.34	.642	63.25
Electricians.....	22	1,200	107.3	7.6	115.9	65.13	.591	58.80
Laborers.....	11	67	113.1	8.1	119.8	61.29	.508	60.89
Masons.....	12	41	112.0	8.0	112.0	64.56	.577	64.50
Mechanics.....	19	247	130.4	9.3	115.0	72.78	.658	62.47
Motor breakmen.....	18	190	119.3	8.5	112.0	59.81	.562	56.20
Pumblers.....	21	104	174.2	12.4	173.6	70.42	.413	73.00
Timbermen.....	17	170	92.4	6.6	112.0	59.50	.693	77.87
Trackmen.....	22	163	114.5	8.2	112.0	65.44	.570	63.69
Total, inside occupations.....	22	12,279	98.6	7.1	112.9	65.17	.673	75.70
<b>Outside:</b>								
Ashtmen.....	19	72	129.0	9.1	123.8	56.82	.444	54.47
Blacksmiths.....	22	60	127.0	9.1	112.0	71.56	.572	61.02
Cagers.....	22	119	132.4	9.5	113.3	60.65	.458	51.81
Carpenters.....	15	83	109.8	7.8	112.0	49.73	.454	50.81
Car runners.....	19	88	111.1	7.9	112.0	49.83	.449	50.27
Dumppers.....	22	248	140.0	10.1	129.8	73.80	.532	63.09
Engineers.....	22	314	128.6	9.0	127.3	64.62	.503	63.98
Firemen.....	22	1,211	120.0	8.5	114.9	61.94	.534	60.69
Laborers.....	21	199	122.6	8.8	112.0	54.52	.448	50.14
Leaders.....	20	112	141.9	10.1	112.0	72.81	.551	57.85
Mechanics.....	21	77	129.7	8.3	112.0	56.88	.484	48.58
Oilers.....	10	113	123.5	8.8	112.0	59.80	.485	54.31
Timber cutters.....	11	116	130.3	9.3	112.0	58.91	.467	50.67
Trackmen.....	14	28	115.7	8.3	112.0	55.26	.477	53.40
<b>Outside, breaker:</b>								
Jig runners.....	18	81	120.1	9.2	112.0	53.70	.410	45.93
Platemen.....	21	190	118.7	8.2	112.0	51.13	.430	48.18
Sinters (boys).....	21	380	99.9	7.1	112.0	29.85	.288	33.41
Total, outside occupations.....	22	3,990	121.5	8.6	115.0	54.37	.442	50.81
Grand total, inside and outside occupations.....	22	16,269	104.1	7.4	113.4	62.54	.617	69.67

<sup>1</sup> See explanation on p. 4.

TABLE 2.—AVERAGE HOURS WORKED AND AVERAGE EARNINGS MADE IN ONE-HALF-MONTH PAY-ROLL PERIOD, AND AVERAGE FULL-TIME HOURS AND EARNINGS, BY OCCUPATION—Continued.

*Bituminous.*

Occupation.	Number of establishments.	Number of employees.	Average hours.			Average earnings.		
			Hours actually worked in half month.	Hours worked per week day. <sup>1</sup>	Full-time hours received in half month.	Earnings actually received in half month.	Earnings per hour.	Corresponding full-time earnings in half month.
<i>Inside:</i>								
Brakemen.....	146	1,005	76.1	5.9	105.0	\$44.22	\$0.577	\$60.69
Brattice men and timbermen.....	163	502	84.9	6.6	105.6	51.78	.495	62.97
Capers.....	90	220	82.6	6.6	100.2	51.72	.631	65.20
Drivers.....	165	2,372	72.1	5.8	102.3	44.33	.605	62.16
Laborers.....	164	2,319	74.9	5.8	103.9	45.96	.575	60.17
Loaders.....	128	15,545	65.3	5.0	104.7	50.01	.802	81.23
Miners, hand.....	143	11,279	60.0	4.7	102.5	47.11	.744	80.81
Miners, machine.....	120	1,721	73.2	5.6	104.3	67.75	.947	96.45
Motormen.....	154	894	86.5	6.7	105.3	35.51	.610	60.00
Pumpmen.....	117	344	104.1	8.1	118.0	61.01	.577	68.35
Trackmen.....	187	1,122	82.4	6.4	104.1	49.23	.563	61.84
Trappers (boys).....	103	526	71.5	5.7	101.6	24.26	.339	34.61
Total, inside occupations.....	201	36,180	67.5	5.3	103.8	40.04	.744	76.36
<i>Outside:</i>								
Blacksmiths.....	187	576	100.4	7.8	109.0	62.47	.621	67.54
Carpenters.....	110	260	96.5	7.4	110.1	56.43	.562	64.10
Engineers.....	150	280	116.0	9.1	121.3	60.67	.607	72.77
Firesmen.....	122	443	112.2	8.9	124.6	60.26	.580	66.88
Laborers.....	198	2,860	83.7	6.5	106.3	42.00	.500	53.22
Total, outside occupations.....	201	4,319	91.7	7.2	110.0	48.96	.529	58.24
Grand total, inside and outside occupations.....	201	40,508	70.1	5.5	104.4	40.03	.721	74.43

<sup>1</sup> See explanation on p. 4.

Most of the information about hours and earnings contained in the table can be easily interpreted without comment. Thus the data given for blacksmiths among the inside occupations in anthracite mining show that they were found to the number of 30 distributed among 13 establishments; that they worked on an average 8.9 hours per week day; that while their full-time hours for the half month were 112 they actually worked during the half month an average of 124.7 hours. The average amount of money earned by these 30 blacksmiths was \$73.56 per person, which shows earnings at the rate of 59.2 cents per hour. Any blacksmith who earned that rate per hour and worked the full-time hours of his occupation and no more would have earned during the pay-roll period \$66.26, the amount shown as full-time earnings.

Attention may be called to the relative hours of contract miners and contract miners' laborers in the anthracite mines. As will be seen from the part of the table for inside employees, the 4,887 contract

miners included in the survey worked on an average 6.8 hours per day, while the average of 1,855 contract miners' laborers was only 5.6 hours. It would naturally be expected that the hours of the miners would be less than those of the miners' laborers. It has been the general practice in the past for a miner to work until he has brought down enough coal to keep his laborers busy for the rest of the day and then to leave the mine. Apparently the shortage of contract miners' laborers, which has prevailed for some time, has brought about a change in the practice in this respect. This shortage of laborers may be inferred from the fact that whereas formerly each miner employed one or more laborers to load the coal that he brought down, the figures in the survey show more than two and one-half times as many contract miners as contract miners' laborers. From this it is to be inferred that a large proportion of the miners remain in the mine and load their own coal; that they spend so many additional hours in loading coal that even when their hours are combined with the shorter hours of miners who depend upon laborers to load their coal, the average for the whole group of miners is very considerably increased and, in fact, exceeds the average hours worked by the contract miners' laborers. It is probable that the relatively short hours of the contract miners' laborers in comparison with the hours of the miners was due to the restless spirit prevailing among the laborers at the time of the survey. This restlessness caused much shifting of laborers from mine to mine and from district to district in search of working places where either better conditions could be found or more money could be made.

In bituminous mines, however, no such excess in the number of miners as compared with loaders appears. It must be borne in mind that loaders work after machine miners only, and therefore that the 13,347 loaders shown in the bituminous table are to be correlated with the 1,721 machine miners in the same table. The discrepancy between the number of mines for which these two occupations are tabulated is due to the fact that in an occasional mine record was not kept of the time of the miners but was kept for the loaders. In such cases the information that was available was used in making up the tables.

In Table 3 is shown in greater detail for certain selected occupations the same data presented in summary form in Table 2. For anthracite mining the information is given for each colliery separately for the two most important occupations, contract miners and contract miners' laborers. For bituminous mining the information is given for each State separately for six inside occupations, in which nearly 90 per cent of all inside employees are found, and for one outside occupation comprising nearly two-thirds of all outside employees.

TABLE 3.—AVERAGE HOURS WORKED, AVERAGE EARNINGS MADE, AND AVERAGE FULL-TIME HOURS AND EARNINGS FOR SELECTED OCCUPATIONS FOR ONE-HALF-MONTH PAY-ROLL PERIOD.

## Anthracite.

Establishment, colliery, and occupation.	Average hours.			Average earnings.		
	Number of employees.	Hours actually worked in half month.	Hours worked per day.	Full-time hours in half month.	Earnings actually received in half month.	Corresponding full-time earnings in half month.
<b>Contract miners:</b>						
Establishment A—						
Colliery 1.....	227	89.8	6.4	112	\$84.57	\$107.07
Colliery 2.....	261	98.9	7.1	112	78.96	89.00
Colliery 3.....	44	111.0	7.9	112	92.81	95.20
Colliery 4.....	502	98.9	7.1	112	73.40	737
Establishment B—Colliery 1.....	145	101.5	7.3	112	83.81	840
Establishment C—Colliery 1.....	355	98.8	6.9	112	78.70	812
Establishment D—Colliery 1.....	131	96.8	6.9	112	77.05	808
Establishment E—Colliery 1.....	135	94.2	6.7	112	88.36	943
Establishment F—						
Colliery 1.....	351	98.5	7.0	112	72.78	716
Colliery 2.....	111	78.8	5.3	112	68.88	972
Colliery 3.....	189	87.2	6.2	112	70.79	831
Colliery 4.....	157	78.2	5.7	112	79.20	983
Establishment G—						
Colliery 1.....	294	90.8	7.1	112	76.80	774
Colliery 2.....	214	90.7	6.5	112	74.39	822
Establishment H—						
Colliery 1.....	211	94.8	6.8	112	75.97	788
Colliery 2.....	216	96.0	6.1	112	82.69	964
Establishment I—Colliery 1.....	235	105.4	7.5	112	74.84	718
Establishment J—						
Colliery 1.....	376	102.0	7.3	112	104.04	1,041
Colliery 2.....	133	68.6	6.9	112	104.44	1,077
Establishment K—						
Colliery 1.....	225	84.3	6.0	112	66.02	760
Colliery 2.....	174	84.9	6.1	112	76.18	891
Colliery 3.....	201	108.7	7.9	112	80.24	725
<b>Contract miners' laborers:</b>						
Establishment A—						
Colliery 1.....	241	70.7	5.0	112	50.70	715
Colliery 2.....	184	82.3	5.9	112	52.88	640
Colliery 3.....	176	98.4	7.1	112	55.36	571
Colliery 4.....	210	72.2	5.2	112	41.44	494
Establishment B—Colliery 1.....	77	84.0	6.0	112	56.01	680
Establishment C—Colliery 1.....	82	85.0	6.1	112	58.72	691
Establishment D—Colliery 1.....	115	85.2	6.1	112	58.08	696
Establishment E—Colliery 1.....	95	89.4	6.4	112	68.02	700
Establishment F—						
Colliery 1.....	75	82.9	5.9	112	49.73	595
Colliery 2.....	68	61.8	4.4	112	33.22	347
Colliery 3.....	65	63.2	4.5	112	49.36	731
Establishment G—						
Colliery 1.....	119	85.6	4.5	112	39.86	627
Colliery 2.....	128	72.1	5.2	112	52.42	727
Establishment H—						
Colliery 1.....	24	71.1	5.1	112	38.60	541
Colliery 2.....	23	84.6	6.0	112	46.82	655
Establishment I—Colliery 1.....	80	82.6	5.9	112	46.82	617
Establishment J—						
Colliery 1.....	15	76.7	5.5	112	41.30	536
Colliery 2.....	11	79.1	5.7	112	42.31	538
Colliery 3.....	51	73.2	5.2	112	39.22	556
Colliery 4.....	38	72.8	5.2	112	41.73	573
Colliery 5.....	22	101.0	7.2	112	50.99	565

TABLE 3.—AVERAGE HOURS WORKED, AVERAGE EARNINGS MADE, AND AVERAGE FULL-TIME HOURS AND EARNINGS FOR SELECTED OCCUPATIONS FOR ONE-HALF-MONTH PAY-ROLL PERIOD.—Continued.

## Bituminous.

State and occupation.	Number of establishments.	Number of employees.	Average hours.			Average earnings.		
			Hours actually worked in half month.	Hours worked per week.	Full-time hours in half month.	Earnings actually received in half month.	Earnings per hour.	Corresponding full-time earnings in half month.
<b>Alabama:</b>								
Drivers.....	5	180	67.7	5.9	93.9	\$29.80	\$0.441	\$41.44
Laborers, inside.....	5	107	59.3	5.4	88.7	24.82	.402	35.80
Laborers, outside.....	5	140	75.2	6.4	94.9	28.18	.373	55.40
Loaders.....	2	307	62.5	4.8	104.0	45.88	.794	73.33
Miners, hand.....	4	455	39.5	5.5	87.9	40.41	.692	50.53
Miners, machine.....	1	12	71.6	5.5	104.0	80.80	1.157	120.85
Trackmen.....	5	18	72.7	6.0	98.7	34.20	.669	46.24
<b>Colorado:</b>								
Drivers.....	17	212	71.2	5.5	104.0	47.11	.662	68.89
Laborers, inside.....	11	125	82.8	6.4	104.0	54.20	.636	68.21
Laborers, outside.....	12	237	85.4	6.4	112	63.54	.591	58.16
Loaders.....	8	389	65.4	5.0	104.0	50.65	.789	62.07
Miners, hand.....	16	1,268	61.4	4.7	104.0	47.42	.777	80.85
Miners, machine.....	11	166	65.5	5.4	104.0	72.73	1.028	106.89
Trackmen.....	17	57	81.6	6.3	104.0	54.47	.668	69.44
<b>Illinois:</b>								
Drivers.....	16	380	64.7	5.0	104.0	40.43	.625	65.00
Laborers, inside.....	16	404	60.2	4.6	104.0	36.03	.708	62.29
Laborers, outside.....	16	251	82.6	6.4	104.0	45.37	.559	57.22
Loaders.....	9	2,049	57.4	4.4	104.0	51.03	.889	92.52
Miners, hand.....	8	1,669	62.2	4.8	104.0	47.72	.761	70.29
Miners, machine.....	10	280	56.6	4.4	104.0	61.02	1.089	113.26
Trackmen.....	15	190	73.9	5.7	104.0	46.20	.625	64.98
<b>Indiana:</b>								
Drivers.....	9	142	55.9	5.6	80.0	35.17	.628	50.25
Laborers, inside.....	9	159	71.9	7.2	80.0	45.10	.625	50.10
Laborers, outside.....	10	122	74.3	7.4	80.0	40.73	.549	43.93
Loaders.....	7	1,098	45.7	4.6	80.0	40.62	.837	67.00
Miners, hand.....	4	525	56.6	5.7	80.0	36.47	.633	50.68
Miners, machine.....	7	136	47.2	4.7	80.0	55.79	1.156	92.47
Trackmen.....	9	72	70.8	7.1	80.0	44.28	.625	50.00
<b>Iowa:</b>								
Drivers.....	11	99	70.3	6.1	104.0	49.48	.623	65.22
Laborers, inside.....	10	64	82.5	6.3	104.0	49.70	.603	62.75
Laborers, outside.....	11	72	81.4	6.3	104.0	43.25	.531	55.20
Loaders.....	2	67	60.2	4.6	104.0	54.17	.864	88.71
Miners, hand.....	11	962	61.5	4.7	104.0	43.37	.704	73.25
Miners, machine.....	12	12	71.3	5.5	104.0	52.55	.739	78.49
Trackmen.....	8	11	69.0	6.9	104.0	60.80	.836	86.16
<b>Kansas:</b>								
Drivers.....	12	119	75.4	5.8	104.0	47.28	.627	65.20
Laborers, inside.....	8	30	88.1	6.7	106.6	55.05	.625	60.01
Laborers, outside.....	12	48	89.4	6.9	104.0	49.08	.580	57.20
Loaders.....	12	1,462	53.7	4.1	104.0	42.75	.794	82.62
Miners, machine.....	12	31	72.1	5.5	104.0	45.69	.633	65.83
Trackmen.....	12	31	72.1	5.5	104.0	45.69	.633	65.83
<b>Kentucky:</b>								
Drivers.....	14	135	79.4	6.1	103.6	39.13	.491	50.97
Laborers, inside.....	13	182	71.2	5.5	103.3	32.03	.450	46.55
Laborers, outside.....	9	215	83.8	6.3	104.0	44.58	.523	44.58
Loaders.....	17	1,361	36.9	4.5	104.0	40.42	.684	71.18
Miners, hand.....	10	192	53.8	4.6	133.5	54.49	.625	93.03
Miners, machine.....	14	130	76.2	5.9	104.0	58.62	.726	76.54
Trackmen.....	19	148	77.3	6.0	103.8	40.07	.516	53.15
<b>Missouri:</b>								
Drivers.....	4	32	70.9	5.4	104.0	42.15	.595	61.81
Laborers, inside.....	5	51	70.6	5.5	104.0	42.74	.595	61.83
Laborers, outside.....	5	5	87.8	6.7	104.0	45.88	.594	54.51
Loaders.....	5	461	52.5	4.1	104.0	50.57	.961	99.98
Miners, hand.....	5	14	83.0	6.4	104.0	51.73	.625	64.81
Miners, machine.....	5	14	83.0	6.4	104.0	51.73	.625	64.81
Trackmen.....	5	14	83.0	6.4	104.0	51.73	.625	64.81
<b>Missouri:</b>								
Drivers.....	8	90	68.8	5.0	102.2	39.98	.625	64.50
Laborers, inside.....	9	120	54.4	4.2	102.2	34.19	.501	50.19
Laborers, outside.....	10	62	66.0	5.1	103.7	36.07	.443	56.56
Loaders.....	6	283	56.9	4.0	104.0	42.86	.778	80.34
Miners, hand.....	6	629	47.3	4.5	102.9	36.42	.625	64.20
Miners, machine.....	6	112	65.0	5.0	104.0	43.27	.667	68.38
Trackmen.....	9	20	78.8	5.9	104.3	48.27	.628	65.46

TABLE 3.—AVERAGE HOURS WORKED, AVERAGE EARNINGS MADE, AND AVERAGE FULL-TIME HOURS AND EARNINGS FOR SELECTED OCCUPATIONS FOR ONE-HALF-MONTH PAY-ROLL PERIOD—Continued.

Bituminous—Concluded.

State and occupation.	Number of establishments.	Number of employees.	Average hours.			Average earnings.		
			Hours actually worked in half month.	Hours worked per day.	Full-time hours in half month.	Earnings actually received in half month.	Earnings per hour.	Corresponding full-time earnings in half month.
<b>New Mexico:</b>								
Drivers.....	6	118	69.0	5.3	104.0	\$45.71	\$0.653	\$68.93
Laborers, inside.....	5	41	82.4	6.3	104.0	53.41	.665	69.20
Laborers, outside.....	6	114	83.3	6.9	117.2	41.52	.463	54.28
Loaders.....	5	132	77.4	5.9	104.0	59.50	.649	67.50
Miners, hand.....	6	338	71.7	5.5	104.0	52.12	.719	74.74
Miners, machine.....	5	33	74.7	5.7	104.0	76.45	1.002	104.22
Trackmen.....	6	27	86.2	6.6	104.0	57.08	.993	98.98
<b>Ohio:</b>								
Drivers.....	12	208	91.4	7.3	104.0	56.74	.625	65.07
Laborers, inside.....	11	97	82.6	6.4	104.0	49.34	.523	54.31
Laborers, outside.....	13	146	93.5	7.4	104.0	62.47	.662	68.48
Loaders.....	13	1,970	76.8	5.9	104.0	58.49	.736	76.65
Miners, hand.....	2	13	82.9	6.4	104.0	53.56	.777	80.79
Miners, machine.....	13	245	88.5	6.9	104.0	86.95	1.003	104.32
Trackmen.....	13	67	109.9	8.5	104.0	68.67	.628	64.97
<b>Oklahoma:</b>								
Drivers.....	8	103	84.1	6.5	104.0	52.54	.625	65.00
Laborers, inside.....	2	95	105.2	8.1	104.0	65.43	.621	64.03
Laborers, outside.....	8	47	97.1	7.5	104.0	53.08	.546	56.79
Loaders.....	2	135	68.0	5.2	104.0	48.33	.702	72.97
Miners, hand.....	7	354	64.9	5.0	104.0	53.82	.822	85.52
Miners, machine.....	2	12	75.6	5.8	104.0	50.66	.666	69.28
Trackmen.....	4	11	78.4	6.0	104.0	48.98	.625	65.00
<b>Pennsylvania:</b>								
Drivers.....	18	324	92.2	6.0	110.3	52.19	.634	69.89
Laborers, inside.....	39	633	89.5	6.5	112.3	53.07	.599	67.13
Laborers, outside.....	31	804	89.6	6.6	112.1	46.11	.516	58.19
Loaders.....	28	4,117	73.3	5.4	112.2	55.21	.835	84.67
Miners, hand.....	28	1,889	64.0	4.7	109.2	57.49	.902	98.60
Miners, machine.....	26	546	81.0	6.0	110.8	72.02	.913	101.64
Trackmen.....	29	210	68.3	7.1	111.6	60.65	.628	70.08
<b>Tennessee:</b>								
Drivers.....	6	120	64.6	6.1	85.1	27.07	.415	35.37
Laborers, inside.....	5	66	63.5	5.3	97.5	26.82	.428	41.36
Laborers, outside.....	6	117	62.1	5.7	87.4	22.38	.359	31.68
Loaders.....	4	139	49.0	4.2	87.1	33.36	.704	62.67
Miners, hand.....	7	367	49.6	4.6	88.2	34.08	.600	62.96
Miners, machine.....	3	15	46.0	5.2	84.4	26.25	.492	41.87
Trackmen.....	6	28	69.8	5.9	93.7	33.31	.475	44.53
<b>Utah:</b>								
Drivers.....	7	62	64.2	4.9	104.0	44.10	.687	71.49
Laborers, inside.....	7	44	69.2	5.3	104.0	45.13	.665	69.21
Laborers, outside.....	6	129	75.2	6.3	104.0	44.38	.565	60.96
Loaders.....	5	235	61.4	4.7	104.0	57.95	.953	99.14
Miners, hand.....	5	205	61.5	4.8	104.0	57.76	.940	97.75
Miners, machine.....	2	24	73.4	5.6	104.0	92.07	1.283	133.34
Trackmen.....	7	26	70.8	5.9	104.0	53.16	.693	71.99
<b>Virginia:</b>								
Drivers.....	2	8	53.1	4.1	104.0	20.32	.394	40.95
Laborers, inside.....	3	30	45.2	3.5	104.0	19.48	.442	45.97
Laborers, outside.....	3	46	74.8	5.8	104.0	29.63	.366	41.15
Loaders.....	4	220	62.1	4.8	104.5	38.93	.634	66.16
Miners, hand.....	1	12	68.3	5.8	104.0	54.14	1.089	112.35
Miners, machine.....	4	27	72.9	5.6	104.0	52.66	.707	73.52
Trackmen.....	4	62	61.9	4.8	104.0	29.08	.470	48.53
<b>West Virginia:</b>								
Drivers.....	6	49	66.1	5.3	105.1	38.62	.561	58.87
Laborers, inside.....	6	116	78.6	6.0	108.9	29.28	.301	32.49
Laborers, outside.....	13	162	83.5	6.4	112.4	36.42	.445	49.29
Loaders.....	13	749	61.1	4.7	108.3	47.83	.822	85.03
Miners, hand.....	5	168	58.0	4.5	111.4	52.58	.910	101.41
Miners, machine.....	8	62	89.0	6.8	109.5	71.90	.533	56.67
Trackmen.....	12	98	88.1	6.8	110.5	46.72	.529	56.07
<b>Wyoming:</b>								
Drivers.....	4	32	69.7	5.4	104.0	47.21	.678	70.50
Laborers, inside.....	3	33	72.7	5.6	104.0	44.41	.667	69.32
Laborers, outside.....	4	45	81.8	6.3	104.0	47.09	.600	62.43
Loaders.....	4	74	59.7	4.4	104.0	45.85	.783	81.42
Miners, hand.....	4	169	54.6	4.2	104.0	57.09	1.096	102.58
Miners, machine.....	1	9	66.8	5.1	104.0	53.15	1.365	141.83
Trackmen.....	4	13	81.6	6.3	104.0	55.29	.678	70.48

In anthracite mines, as a general rule, high earnings are found in the same mines in which short hours are worked. In order to determine to what extent that relation holds, the mines have been brought together into three groups based upon the average number of hours per day worked by the miners in the different mines. Thus there are 8 mines with hours of miners exceeding 7 per day, 7 mines with hours from 6½ to 7, inclusive, and 7 mines with hours below 6½. In the following table is shown for each of these groups the number of employees, the average hours worked per day, and the average earnings per hour:

TABLE 4.—HOURS AND EARNINGS OF CONTRACT MINERS.

Item.	Number of mines.	Number of employees.	Average hours worked per day.	Average earnings per hour.
Group 1.....	8	2,058	7.3	\$0.813
Group 2.....	7	1,530	6.7	.824
Group 3.....	7	1,299	6.6	.902

From this table it appears that in the 8 mines in which miners worked on the average more than 7 hours per day average earnings were 81.3 cents per hour; that in the 7 mines in which the average hours were 6.7 per day the average hourly earnings were 82.4 cents; that in the 7 mines in which hours averaged 6 per day, earnings averaged 90.2 cents per hour. As these figures are based on the records of 4,887 miners, they suggest the inference that the relation between high earnings and low hours is not altogether accidental.

In the bituminous mines it will be noticed that as a rule the three actual mining occupations, hand miners, machine miners, and loaders show higher average earnings per hour than any of the other occupations. With very few exceptions these three occupations are paid on a tonnage basis, while all other occupations are paid at a time rate. Hence the hourly earnings of miners and loaders are limited only by their ability to get out coal, while the hourly earnings of other employees can not exceed the amount per hour for which they have contracted to work.

Occasionally, however, a mine is found in which one or more of these occupations are paid at a time rate. Thus in Virginia fully 50 per cent of the machine miners work at an hourly rate, and in Oklahoma practically all of them are paid on that basis. That is the probable explanation of the fact that in the latter State loaders made higher average earnings per hour than machine miners, the miners cutting sufficient coal to enable the loaders to obtain the higher earnings.

An examination of any one of the tables already presented will show discrepancies between the full-time hours of many occupations and the hours actually worked, and corresponding differences between



actual earnings for the pay-roll period and full-time earnings, or the amount that would have been earned if the employees had worked the full-time hours of the occupation. The facts as to irregularity of work are presented in the following table. Employees in each occupation are grouped according to the percentage of full time actually worked by them. In the first part of the table the number of employees in each group is shown, and in the second part the percentage which that number constitutes of the total number of employees in the occupation.

TABLE 5.—NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED PER CENT OF FULL TIME, BY OCCUPATION.

Anthracite.												
Occupation.	Number of establishments.	Number of employees.	Number of employees working each classified per cent of full time.					Per cent of employees working each classified per cent of full time.				
			Under 25.	25 and under 50.	50 and under 75.	75 and under 100.	Over 100.	Under 25.	25 and under 50.	50 and under 75.	75 and under 100.	Over 100.
<i>Anthracite.</i>												
Inside:												
Blacksmiths.....	13	30	1	1	2	1	25	3	3	7	3	83
Brattice men.....	17	116	1	4	10	27	24	50	1	3	9	23
Cagers.....	22	234	5	7	9	33	19	161	2	3	4	14
Car runners.....	17	342	11	15	23	69	51	173	3	4	7	20
Company miners.....	19	656	70	71	71	134	75	235	11	11	11	36
Company miners' laborers.....	19	632	31	34	53	180	108	226	5	5	8	17
Consideration miners.....	10	4	8	23	22	61	124	107	101	5	4	12
Contract miners.....	4,887	141	237	697	2,731	406	675	3	5	14	56	8
Contract miners' laborers.....	21	1,835	255	309	353	740	149	149	14	11	19	40
Door tenders (boys).....	30	247	4	9	15	67	70	82	2	4	6	27
Drivers.....	22	479	20	18	25	125	106	188	4	4	5	26
Engineers.....	17	121	2	1	13	17	88	2	1	11	14	73
Laborers.....	12	1,900	51	73	86	396	247	477	4	6	7	22
Machinists.....	11	67	3	5	7	18	34	4	7	10	27	51
Masons.....	12	41	1	1	8	16	15	2	2	2	36	37
Motormen.....	19	247	3	6	9	29	75	132	2	4	8	85
Motor brakemen.....	18	120	5	4	9	38	12	123	3	2	5	20
Pumpmen.....	21	104	1	5	4	9	51	34	1	5	9	49
Timbermen.....	17	120	19	17	39	18	60	11	10	23	11	35
Trackmen.....	22	163	2	3	11	35	22	10	1	2	7	21
Total, inside occupations.....	22	12,279	648	741	1,462	4,676	1,503	3,249	5	6	12	38
Total, mining occupations.....	22	8,528	520	573	1,235	3,500	815	1,416	6	7	14	46
Total, all other inside occupations.....	22	3,751	128	168	227	767	688	1,803	4	4	6	20
Outside:												
Achmen.....	19	72	2	1	2	16	11	40	3	1	3	22
Blacksmiths.....	22	66	3	3	4	3	7	40	5	7	5	12
Cagers.....	22	119	3	12	29	84	1	3	10	17	17	71
Carpenters.....	22	230	6	15	17	46	6	150	2	6	7	6
Car runners.....	15	83	2	4	8	23	9	37	2	5	10	28
Dummers.....	19	88	5	4	21	4	49	6	6	5	24	5
Engineers.....	22	248	2	4	5	19	25	183	1	2	2	8
Firemen.....	22	314	10	16	23	75	132	3	2	5	24	45
Laborers.....	22	1,211	40	48	79	285	162	667	3	4	7	19
Leaders.....	21	169	3	5	8	28	19	125	2	3	4	9
Machinists.....	20	112	3	6	4	10	3	89	3	5	4	7
Oilers.....	21	77	1	1	1	17	8	49	1	1	2	10
Repairmen.....	19	115	2	4	6	13	17	4	6	12	15	63
Timber cutters.....	19	115	2	1	2	10	13	87	2	1	2	9
Trackmen.....	14	28	1	1	2	3	15	4	7	11	21	51
Wreckers.....	18	81	3	2	1	11	11	11	4	2	14	14
Flatmen.....	21	180	8	1	10	41	22	15	4	2	6	23
Slaters (boys).....	21	589	14	21	50	269	92	134	2	4	9	16
Total, outside occupations.....	22	3,930	108	130	222	830	500	2,110	3	3	6	21

TABLE 5.—NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED PER CENT OF FULL TIME, BY OCCUPATION.—Continued.

Bituminous.														
Occupation.	Number of establishments.	Number of employees.	Number of employees working each classified per cent of full time.					Per cent of employees working each classified per cent of full time.						
			Under 25.	25 and under 50.	50 and under 75.	75 and under 100.	Over 100.	Under 25.	25 and under 50.	50 and under 75.	75 and under 100.	Over 100.		
Inside:														
Brakemen.....	146	1,006	72	101	314	384	28	106	7	10	31	38	3	11
Brace men and timbermen.....	163	932	47	62	192	372	77	182	5	7	21	40	20	22
Cagers.....	90	220	8	8	67	80	8	49	4	4	36	4	4	4
Drivers.....	165	2,372	173	223	838	802	84	242	7	9	35	34	4	15
Laborers.....	164	2,319	257	238	612	668	135	349	11	11	26	30	4	16
Leaders.....	128	13,345	816	2,773	6,578	8,266	286	117	6	17	46	24	1	1
Miners, hand.....	145	11,379	630	2,444	6,325	7,780	107	78	6	21	56	19	2	1
Miners, machine.....	129	1,721	74	102	227	551	82	95	4	7	29	40	4	21
Motormen.....	154	854	35	53	113	340	40	190	4	7	29	40	4	21
Pumpmen.....	117	344	23	22	44	101	43	111	7	6	13	29	13	32
Trackmen.....	187	1,122	64	102	274	588	86	268	6	8	34	33	19	19
Trappers (boys).....	103	536	26	43	228	199	48	26	6	8	43	30	9	5
Total, inside occupations.....														
	201	36,186	2,445	7,911	16,413	8,936	1,038	1,768	6	16	45	25	3	5
Total mining occupations.....														
	201	26,445	1,529	4,909	13,630	5,603	484	280	6	19	52	21	2	1
Total, all other inside occupations.....														
	201	9,741	719	882	2,783	3,333	554	1,473	7	9	29	34	6	15
Outside:														
Blacksmiths.....	187	376	13	13	45	127	23	155	3	3	12	24	6	41
Carpenters.....	116	260	11	7	48	88	7	79	4	3	18	34	10	30
Engineers.....	109	380	6	11	41	92	115	116	1	3	11	26	30	31
Firemen.....	122	445	14	22	40	132	110	136	3	5	16	30	25	25
Laborers.....	188	2,469	157	235	716	1,040	141	634	5	8	26	36	8	19
Total, outside occupations.....														
	201	4,319	200	296	934	1,479	416	1,004	5	7	22	34	10	23

An examination of the table brings out the fact that a very small percentage of the employees in either outside or inside groups worked exactly full time. Of all inside employees in anthracite mines, 12 per cent are recorded as working full time and no more, while of all outside employees the corresponding number is 13 per cent. If the figures for the miners and the miners' laborers, that is, the employees who are engaged directly in mining and getting out the coal, are segregated and compared with the figures for the remaining employees of the mine, an interesting situation is revealed. It is found that of the 8,528 miners and miners' laborers only 27 per cent worked full time or over, whereas of all the employees in the remaining inside occupations 66 per cent worked full time or over and in outside occupations 67 per cent are found in the same class. The largest group of miners and laborers, constituting 46 per cent of the entire number, is found in the class which worked between 75 per cent and 100 per cent full time, while only 20 per cent of laborers in other inside occupations and 21 per cent of laborers in outside occupations are in that group. Further computation would show that the 8,528 miners and miners' laborers worked on the average

\$2.5 per cent of full time while the 7,681 employees in other occupations, outside and inside, worked 102.2 per cent of full time.

Whatever may have been the cause of the failure of employees in the anthracite mines to work full-time hours, that failure can not be attributed to short hours of operation of the mines, since no mines working less than full time were included in the survey. Among the bituminous mines, however, many short-time pay rolls were included, that is, pay rolls for periods in which mines were in operation only a part of the full-time hours of the period. For these mines, therefore, Table 5 furnishes no basis for apportioning the responsibility for the failure to work full time as between employees, the management of the mine, and causes independent of either. The figures may be taken, however, as an indication of the social waste involved in the inefficient use of economic resources due to irregularity of operation.

The amount of lost time found in the bituminous division of the coal-mining industry at the time of the survey is very strikingly brought out by these figures. Thus of all employees working inside the mines only 8 per cent worked full time or over, while 67 per cent, two-thirds of the entire number, worked less than 75 per cent of full time. Outside employees show better conditions, 33 per cent working full time or over, and only 34 per cent less than 75 per cent of full time.

A comparison of the hours of employees directly engaged in getting out coal, namely, hand miners, machine miners, and loaders, with the hours of employees in other occupations, indicates that conditions in the bituminous mines are in this respect much like those in anthracite mines. For only 3 per cent of the employees in the mining occupations worked full time or over, as against 21 per cent for other inside occupations and 33 per cent for outside occupations. If it were necessary for the hours of other occupations to increase *pari passu* with those of the mining occupations, full-time hours for the miners and loaders would call for a very large amount of overtime work on the part of those in other occupations.

As was pointed out above, numerous part-time pay rolls were included in the survey of bituminous mining, and it is consequently impossible to determine from the table just given where the responsibility lies for the broken time. To assist in apportioning the immediate responsibility as between the failure of employers to operate their mines and the failure of employees to work when the mines are in operation the following table (Table 6) has been prepared. It deals only with hand miners, machine miners, and loaders. These three occupations were selected because the hours of employees in these occupations are usually limited by the hours of operation of

the mines, whereas employees in other occupations may, and frequently do, perform work on days when the mines are not in operation.

Table 6 sets forth in parallel columns average full-time hours of the pay-roll period, average hours of operation of the mines during the period, and average hours actually worked by the employees; average full-time earnings (what would have been earned if all employees had worked full time), average possible earnings during the hours of operation of the mines (what would have been earned if all employees had worked all the hours the mines were in operation), and average actual earnings. The last three columns show for each of the two groups of facts, that relating to hours and that relating to earnings, the ratio of the second column to the first, of the third to the second, and of the third to the first. These ratios are practically the same for both series.

TABLE 6.—AVERAGE FULL-TIME HOURS, HOURS OF OPERATION OF MINES, AND HOURS WORKED BY EMPLOYEES; AND AVERAGE FULL-TIME EARNINGS, POSSIBLE EARNINGS DURING TIME OF OPERATION, AND ACTUAL EARNINGS, IN BITUMINOUS MINES IN ONE-HALF-MONTH PAY-ROLL PERIOD, BY STATES.

State.	Number of establishments.	Number of employees.	Average hours.			Average earnings.			Per cent.		
			Full-time hours in half month.	Hours of operation in half month.	Hours employees actually worked in half month.	Full-time earnings in half month.	Possible earnings during time of operation.	Actual earnings during half month.	Column B is of column A.	Column C is of column B.	Column C is of column A.
			A	B	C	A	B	C			
Alabama.....	4	455	87.9	88.0	59.5	\$52.53	\$59.29	\$40.41	100.1	67.6	67.7
Colorado.....	16	1,288	104.0	73.0	61.4	80.85	57.24	47.12	78.3	83.4	86.0
Illinois.....	8	1,069	104.0	76.2	62.2	78.20	58.05	47.72	73.3	81.6	80.8
Indiana.....	4	325	80.0	70.1	56.6	36.06	44.40	30.47	97.0	80.7	70.8
Iowa.....	11	862	104.0	71.5	61.5	73.23	50.38	43.37	68.8	86.0	80.1
Kansas.....	12	1,482	104.0	68.9	53.7	82.62	54.78	42.75	68.3	77.9	81.6
Kentucky.....	10	192	95.5	68.5	53.8	29.13	43.93	34.08	74.3	77.4	87.5
Maryland.....	5	491	104.0	79.6	53.5	96.98	76.48	50.57	70.3	67.2	61.4
Missouri.....	8	628	102.0	70.1	52.3	94.20	63.72	36.42	68.1	81.7	58.7
New Mexico.....	6	228	104.0	78.2	71.7	73.74	54.78	52.12	73.3	98.1	68.9
Ohio.....	2	13	104.0	104.0	82.9	83.79	80.79	63.56	100.0	70.7	70.7
Oklahoma.....	7	554	104.0	54.5	64.9	83.52	77.99	53.82	91.2	68.5	62.4
Pennsylvania.....	28	1,559	108.2	80.0	64.0	98.69	72.27	57.49	73.3	80.0	58.6
Tennessee.....	7	367	88.2	61.7	49.6	62.95	44.67	34.68	70.8	80.4	56.2
Utah.....	5	206	104.0	51.8	61.9	98.73	49.68	37.66	49.8	119.5	50.5
West Virginia.....	5	198	111.4	71.4	58.0	101.41	65.00	52.98	64.1	81.2	52.1
Wyoming.....	4	100	104.0	68.2	54.6	108.88	72.68	57.69	65.6	80.1	52.5
Total.....	142	11,337	102.5	71.1	60.0	80.85	56.10	47.12	80.4	84.5	88.6

\* All figures relate only to bituminous mines.

TABLE 6.—AVERAGE FULL-TIME HOURS, HOURS OF OPERATION OF MINES, AND HOURS WORKED BY EMPLOYEES, AND AVERAGE FULL-TIME EARNINGS, POSSIBLE EARNINGS DURING TIME OF OPERATION, AND ACTUAL EARNINGS, IN BITUMINOUS MINES IN ONE-HALF-MONTH PAY-ROLL PERIOD, BY STATES—Continued.

State.	Number of establishments.	Number of employees.	Average hours.			Average earnings.			Per cent.		
			Full-time hours in half month.	Hours of operation in half month.	Hours employees actually worked in half month.	Full-time earnings in half month.	Possible earnings during time of operation.	Actual earnings during half month.	Column B is of column A.	Column C is of column B.	Column D is of column A.
Colorado.....	11	66	104.0	76.2	69.5	\$106.89	\$78.35	\$73.73	73.3	91.2	68.8
Illinois.....	10	280	104.0	68.5	56.6	115.26	74.41	61.02	65.7	82.9	54.4
Indiana.....	7	136	80.0	56.5	47.2	52.47	58.55	55.79	63.1	93.5	59.0
Iowa.....	2	12	104.0	70.0	71.3	78.49	59.65	52.55	76.0	90.3	68.6
Kentucky.....	1	130	104.0	70.9	76.2	76.54	52.20	58.02	68.2	107.5	73.3
Missouri.....	6	112	104.0	83.2	65.0	69.38	55.50	43.27	80.0	78.1	62.5
New Mexico.....	5	135	104.0	70.1	74.7	104.22	70.24	76.15	67.4	108.3	71.8
Ohio.....	245	104.0	94.5	89.5	89.5	104.32	94.83	86.96	90.9	94.7	85.1
Oklahoma.....	2	12	104.0	92.0	75.6	69.28	61.31	50.66	88.5	82.2	72.7
Pennsylvania.....	26	546	110.8	85.5	81.0	103.64	78.47	72.02	77.2	94.7	73.1
Tennessee.....	3	15	84.8	65.7	56.0	41.87	32.45	28.25	77.6	85.2	66.0
Utah.....	7	22	104.0	53.1	73.4	133.84	68.14	62.67	51.5	108.2	70.8
Virginia.....	4	27	104.0	65.3	72.9	73.32	53.85	52.66	84.7	78.1	70.1
West Virginia.....	8	62	106.5	65.4	89.0	90.67	54.13	71.90	59.7	106.1	81.3
Total.....	118	1,700	104.3	77.9	73.2	98.06	73.25	67.58	74.7	94.0	70.2

  

Loaders.											
Alabama.....	2	307	104.0	95.9	62.3	\$75.33	\$69.45	\$45.88	92.2	65.0	59.9
Colorado.....	8	389	104.0	81.8	65.4	82.07	64.59	50.63	78.7	80.0	62.9
Illinois.....	0	2,049	104.0	68.0	62.4	92.32	68.31	51.03	65.4	84.4	35.2
Indiana.....	7	1,098	80.0	54.2	45.7	67.00	45.43	40.02	67.8	84.3	57.1
Iowa.....	2	67	104.0	78.9	60.2	58.71	44.56	54.17	75.9	76.3	37.9
Kentucky.....	17	1,301	104.0	86.5	58.9	71.18	59.22	40.42	83.2	68.1	56.6
Missouri.....	6	283	104.0	81.2	56.9	80.34	62.75	42.86	78.1	70.1	51.7
New Mexico.....	5	132	104.0	81.1	77.4	67.50	54.61	50.80	80.9	92.0	74.4
Ohio.....	13	1,970	104.0	93.1	76.8	78.65	70.39	58.40	89.5	82.5	73.8
Oklahoma.....	2	145	104.0	95.1	68.0	72.97	66.69	48.53	91.4	71.5	65.4
Pennsylvania.....	28	4,117	112.0	87.8	73.3	84.67	66.30	55.21	78.3	83.5	65.3
Tennessee.....	4	119	87.0	60.1	46.0	62.67	42.21	33.36	69.0	76.5	52.0
Utah.....	5	225	104.0	47.9	61.4	99.14	45.70	57.95	44.1	128.2	68.0
Virginia.....	4	230	104.5	93.8	62.1	66.18	59.41	38.93	89.8	96.2	59.4
West Virginia.....	13	749	108.3	80.5	61.1	88.05	63.42	47.53	74.3	75.9	56.4
Wyoming.....	3	74	104.0	85.3	56.7	81.42	66.76	45.85	82.0	66.5	54.5
Total.....	128	12,345	104.7	81.2	65.3	81.24	63.04	50.51	77.6	80.4	62.4

<sup>1</sup> All figures relate only to bituminous mines.

A few details of the table may need explanation. Thus, a comparison of the three occupations in the same State will show that in some cases the hours of operation are not the same for all three occupations. This is due to the fact that the mines are not identical for all occupations. For example, loaders were reported at only 2 mines in Iowa, their average hours of operation being 78.9 for the half month, while 11 mines in the same State reported hand miners with an average of 71.5 hours of actual operation during the half month. Thus, including the hours of operation of the 9 mines reporting hand miners and no loaders reduces the average of the hand miners below that of the loaders.

In a few States it will be seen that employees worked more hours than hours of operation of the mines. This is to be accounted for partly by the fact that miners worked overtime on days when the mines were in operation and partly by the fact that in a few cases miners were allowed to work in the mine getting down coal even on days when the mine was nominally not in operation. The latter practice is very unusual in a great majority of the coal-mining States.

From the figures given in Table 6 the immediate responsibility for idle time may be roughly apportioned between the management and the employees. Thus, the average full-time hours of all mines in which hand miners were found were 102.5 for the half month. Hand miners actually worked an average of 60 hours. The difference, 42.5 hours, was the amount of lost time on the part of the hand miners. But of these 42.5 idle hours there were on the average 31.4 hours during which the mines were not in operation. For that amount of idleness, therefore, the operators were immediately responsible. The remaining 11.1 hours of idleness represent the time during which the mines were in operation and opportunity for work was given of which the employees failed to take advantage. For that much idleness, therefore, the miners were immediately responsible.

For all machine miners combined the figures show average hours of idleness 31.1, of which the operators were responsible for 26.4 hours and the miners for 4.7 hours. The corresponding figures for loaders are 39.4, 23.5, and 15.9, respectively. The apportionment of responsibility in any particular State may be ascertained by a similar computation based on the averages given for that State.

In making the statement that operators or miners are immediately responsible for a certain number of hours of idleness there is no intention of implying that blame for failure to work attaches to either party. The figures given in the table furnish no clue as to how much of the idleness on either side was avoidable and how much unavoidable. They can not legitimately be interpreted to imply more than the facts they profess to set forth.

It is unfortunate that no figures showing actual earnings of employees in the coal-mining industry during earlier years are in the possession of the Bureau. For lack of such material, it is impossible for the Bureau to follow its usual method and compute index numbers in the coal-mining industry on the basis of actual earnings. The only method by which an estimate can be made of the changes that have taken place in recent years in the economic situation of employees in the industry is through an analysis of the increases in pay that have been granted as a feature of the various agreements entered into between the operators and the employees.

The following statement shows the effect upon the wages of contract miners in the anthracite field of the various increases that have been

granted, beginning with the award made by the Anthracite Coal Strike Commission which settled the strike of 1902. The figures are given in the form of relatives, with the rate prevailing before the strike of 1902 as 100:

*Relative wage rates of anthracite contract miners.*

[Pre-strike rate, 1902=100.]

1902.....	100.00	1912.....	121.00
1903.....	114.40	1913.....	121.00
1904.....	114.95	1914.....	121.00
1905.....	114.31	1915.....	121.00
1906.....	114.58	1916.....	129.50
1907.....	114.22	April, 1917.....	142.50
1908.....	114.40	November, 1917.....	161.90
1909.....	114.49	November, 1918.....	181.30
1910.....	114.40	1919.....	181.30
1911.....	114.95		

The award of the Anthracite Coal Strike Commission gave these employees a 10 per cent increase in rates. It also provided that for each 5-cent advance in the wholesale price of coal at New York City the miners should have a 1 per cent increase in rate over the new base established by the Commission.

This agreement remained in effect 9 years. During that time the sliding scale was responsible for increases in rate above the 1902 rate varying from 4.22 per cent in 1907 to 4.95 per cent in 1904 and 1911. The average increase for the 9 years was 4.2 per cent. A new agreement was entered into on May 20, 1912. Under this agreement the sliding scale was abolished and in its place was granted an increase of 10 per cent over the rate of 1911. This increased the basic relative from 110, which it had been from 1903 to 1911, to 121. The basic rate for 1911 plus the additional wage received under the sliding scale made the index number for that year 114.95. Therefore, the actual increase brought about by the agreement of 1912 was 6.05 points. The wage of 1912, therefore, shows an increase of 5.2 per cent over that of 1911 and a total increase of 21 per cent over the pre-strike rate of 1902. On May 5, 1916, a new agreement was entered into under which tonnage rates were raised 7 per cent above the rates in 1915. This made a total increase of 29.5 per cent over the rate of 1902. Since 1916 three new voluntary agreements have been entered into, each of which provided an increase in rates. These increases, however, were given not in the form of rate increases but in the form of additions to gross earnings. Thus the agreement of April 26, 1917, provided for the addition of 10 per cent to the gross earnings of each miner as determined by the agreement of May 5, 1916. On November 17, 1917, this was superseded by an agreement giving a 25 per cent increase on gross earnings, based on the agreement of 1916. Finally, on November 15,

1918, the percentage bonus was raised to 40 per cent. Under these last three agreements it will be seen that the net increase in miners' rates above the 1902 base has been 42.5, 61.9, and 81.3 per cent.

The agreement of November 15, 1918, according to its terms, was to remain in effect until the declaration of peace, or until March 31, 1920, if peace was not declared before that day. By a subsequent agreement entered into September 29, 1919, the conditional clause was eliminated and the duration of the agreement until March 31, 1920, made unconditional.

The following table of relatives for bituminous pick or hand miners is based on the rates in the Hocking Valley district of Ohio, as established by the various agreements between the operators' and the miners' associations. The Hocking Valley was selected because that district is the basing district of the central competitive field, constantly used in establishing rates in other bituminous fields.

*Relative wage rates of bituminous pick miners, Hocking Valley District, Ohio.*

[Rate for 1902=100.]

1902.....	100.00	1912.....	125.00
1903.....	112.50	1913.....	125.00
1904.....	106.25	1914.....	130.00
1905.....	106.25	1915.....	130.00
1906.....	112.50	1916.....	130.00
1907.....	112.50	1917 (April).....	149.32
1908.....	112.50	1917 (November).....	168.50
1909.....	112.50	1918.....	168.50
1910.....	118.75	1919.....	168.50
1911.....	118.75		

Most of the changes in rates indicated in the above table have been reached as the result of collective bargaining carried on between the operators' and the miners' associations. In normal times new rates took effect on the 1st of April of any year in which they were introduced. In 1906, however, the new rates were adopted only at the end of a protracted strike, and in 1917 the second increase went into effect in the month of November.

All these relatives in both anthracite and bituminous mining are based on tonnage rates and not on actual earnings. It can not be assumed that earnings will vary from year to year exactly in proportion to changes in rates. But in a general way some indication of the variations in hourly rates from year to year may be obtained by applying the relatives in the last two tables to the earnings of anthracite contract miners and bituminous pick or hand miners in 1919. Reference to the figures in Table 2 will show that the hourly rates of the former in 1919 were 84.2 cents, while for the latter they were 78.4 cents. For the Hocking Valley district for the same year average hourly earnings of pick miners were 77.7 cents.

It must be borne in mind that the index numbers given in any year for the two divisions of the mining industry can not be used as a measure of relative rates for that year as between the two fields. The significance of the numbers in any year lies only in the indication they afford of the percentage of increase that has been granted in the one or the other branch of the industry over the rate prevailing in 1902. They show neither absolute rates in either field, nor relative rates as between the two fields. The only comparison that can be legitimately made between the two series is a comparison of the relative rates of increase from year to year.

**END OF  
TITLE**